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Ultralow background Kapton and Kapton-copper laminates

Signal sensor and readout cables are a fundamental component of rare event and ultrasensitive detectors. While possessing unique electrical and mechanical properties, flexible cables can be a significant contributor to the total detector background. Intrinsic contaminations of Th-232 and U-238 in commercially available flexible cables have been measured in the mBq/kg range, which can be significant compared to the levels required for next-generation rare event detectors. As a first step toward fabricating ultralow background cables, we investigated the possibility of obtaining low radioactivity (microBq/kg range) polyimides and copper-polyimide laminates for use in flexible cables. We have determined the dominant source of contamination in Kapton and demonstrated the ability to produce radiopure Kapton and Kapton-based laminates.

Mini-abstract

Clean Kapton: a gateway to low background flexible cables?

Experiment/Collaboration

Primary author: DI VACRI, Maria Laura (Pacific Northwest National Laboratory)

Co-authors: ARNQUIST, Isaac (Pacific Northwest National Laboratory); SALDANHA, Richard (Pacific Northwest National Laboratory)

Presenter: DI VACRI, Maria Laura (Pacific Northwest National Laboratory)

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